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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,368	09/23/2003	Takafumi Noguchi	Q75436	9196

23373 7590 09/06/2007

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EXAMINER	
CHOI, JACOB Y	
ART UNIT	**PAPER NUMBER**
2885	

MAIL DATE	DELIVERY MODE
09/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/667,368	NOGUCHI, TAKAFUMI	
	Examiner	Art Unit	
	Jacob Y. Choi	2885	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 10-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 10-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 June 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *15 June 2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Examiner acknowledges that the applicant has amended claims 1, 15, and 18 canceled claim 9 and newly added claim 23. Currently, claims 1-8 and 10-23 are pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Note: Claims in a pending application should be given their broadest reasonable interpretation. *In re Pearson*, 181 USPQ 641 (CCPA 1974).

Things clearly shown in reference patent drawing qualify as prior art features, even though unexplained by the specification. *In re Mraz*, 173 USPQ 25 (CCPA 1972).

It has been held that the recitation that an element is "*capable of*" performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

3. Claims **1-8 and 10-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobori (USPN 6,327,554) in view of ODA et al. (US 2002/0180348).

Regarding claim **1**, a light-emitting portion having a higher refractive index than a refractive index of air (e.g., column 8, lines 20-35; "... *a refractive index being n 1.5 ... a*

refractive index being 1.8 n 2.1 ... index being 1.7 n 2.1"), and wherein a minimum light-emission value is equal to or less than 50% of a maximum light-emission value when white light is emitted from the light-emitting portion (e.g., Figures 12-21; column 2, lines 10-60)

Kobori failed to neither specify a minimum light-emission value nor disclose a diffraction grating structure.

First, Kobori does not specifically disclose that a minimum light-emission value is equal to or less than 50% of a maximum light-emission value. However, Kobori teaches changes in the thickness of films forming an organic EL device, which changes in the spectra and luminance of light emitted out of the device in order to use the device with a display device. Therefore, optimum light-emission value is desirable and the general teachings of Kobori (e.g., column 2, lines 10-60; "... *the changes in the thickness of films forming an organic EL device give rise to changes in the spectra and luminance of light emitted out of the device ... which enables light to be effectively taken out of even a structure comprising many reflective surface*") provide guidance as to reconstruct/modify the thickness of films to form a highly effective organic EL device (e.g., Figures 12-21). In addition, it would have been obvious to one having ordinary skill in the art at the time the invention was made to specify possible optimum value of the device (e.g., see Figures 12-21), since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

ODA et al. teaches the diffraction grating structure formed as a constituent element on the organic electroluminescent device and provided to a light-emitting side surface (e.g., Figure 2) of the light-emitting outermost surface side of the light-emitting portion (e.g., Abstract: "... *a diffraction grating is formed ... on the light output side*") and teaches a pitch of a fine convex-concave structure being in various range in μm.

Second, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device and its viewing angle(s), also it is preferable for the grating structure with less internal reflection by adjusting the index of refraction in order to prevent light emitted from the organic EL being reflected at the grating structure and traveling backward. To further clarify, it would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the workable range of the diffusion grating to improve the light extraction efficiency of the device, also it is preferable for the grating structure with less internal reflection by adjusting the index of refraction in order to prevent light emitted from the organic EL being reflected at the grating structure and traveling backward, and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 2, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a color separation filter (e.g., column 20, lines 1-20) provided between the light-emitting portion and the light-emitting

side surface, wherein a minimum value of a spectral product obtained from a light-emission waveform of the white light emitted from the light-emitting portion and a spectral transmittance of the color-separation filter is equal to or less than 50 % of a maximum value (*at least 50 % in a wavelength region of 300 to 700 nm*) thereof, whereby the minimum light-emission value is equal to or less than 50 % of the maximum light-emission value when the white light is emitted from the light emitting portion.

Regarding claim 3, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a color-separation filter (e.g., column 20, lines 1-20), which has minimum transmittance of equal to or less than 50 % of maximum transmittance is used for the color-separation filter.

Regarding claim 4, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting portion includes light-emitting materials for at least two primary colors capable of emitting the white light among light-emitting materials for three primary colors.

Regarding claim 5, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a light-emission ratio of the light-emitting materials for the at least two primary colors among the light-emitting materials for the three primary colors is adjusted to make the minimum light-emission colors is adjusted to make the minimum light-emission value equal to or less than 50 % of the maximum light-emission value when the white light is emitted form the light-emitting portion.

Regarding claim 6, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting portion includes the light-emitting materials for the three primary colors.

Regarding claim 7, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting materials exhibit light emission by singlet exciton (e.g., column 16, lines 5-10).

Regarding claim 8, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting materials exhibit light emission by triplet exciton (e.g., column 16, lines 5-10).

Regarding claim 10, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, ODA et al. discloses a ratio of the depth to the pitch in the fine convex-concave structure ranges from 01-10 [0037]. As explained above, it would have been obvious to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Regarding claim 11, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting portion includes light-emitting materials (e.g., column 20, lines 1-20; "... *an optical thin film such as a dielectric multilayer film may be used ... gives out light from the phosphors contained therein for the color conversion of light emission, and is composed of three components, a binder, a fluorescent material and a light absorbing material*") for at least two primary colors emitting the white light among light-emitting materials for three primary colors.

Regarding claim 12, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a color-separation filter (e.g., column 20, lines 1-20; "... *the substrate may be provided with a color filter film ... it is preferable to control the properties of the color filter in conformity to the light emitted from the organic EL device ... thereby optimizing the efficiency of taking out light emission and color purity*").

Kobori failed to suggest a spectral transmission of the color-separation filter is proximately 7% of a maximum value.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to specify the spectral transmission of the filter, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 13, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the combination of the light-emitting portion and the color separation filter suppresses the transmitted light to extent in the wave range +_ 25 nm or more apart from the maximum light emission wavelength of the light-emitting materials (e.g., column 8, lines 20-60; "... a wavelength region of 300 to 700 nm).

Regarding claim 14, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a color separation filter provided between the light-emitting portion and the light-emitting side surface, wherein a minimum value of a spectral product obtained from a light-emission waveform of the

white light emitted from the light-emitting portion and a spectral transmittance of the color-separation filter is approximately 2% of a maximum value thereof (e.g., column 8, lines 20-60; "... a luminance variation n is confined within +_ 5%).

Regarding claim 15, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting portion comprising, a glass substrate (e.g., "p-layer"), a transparent electrode formed on one side of the glass substrate, a light-emitting layer (e.g., "de") formed on the transparent electrode and a rear electrode formed on the light-emitting layer (e.g., Figure 3). And ODA et al. teaches the diffraction grating structure is formed on the other side of the glass substrate [0006, 0049, 0052] that is the light-emitting outermost surface of the light-emitting portion (e.g., Figure 2). As explained above, it would have been obvious to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Regarding claim 16, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a color separation filter (e.g., column 20, lines 1-20) formed between the glass substrate and the diffraction grating structure. It has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Regarding claim 17, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, ODA et al. discloses the diffraction grating structure is obtained by providing the fine convex-concave structure to the surface of the other side of the glass substrate. As explained above, it would have been obvious to modify

teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Regarding claim 18, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, ODA et al. discloses the diffraction grating structure is formed by bonding an optical film separately manufactured as a transmission type optical film that has the fine convex-concave structure to the other surface of the glass substrate. It has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179. As explained above, it would have been obvious to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Regarding claim 19, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, ODA et al. discloses the diffraction grating structure is obtained by providing the fine convex-concave structure. It has been held rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. As explained above, it would have been obvious to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Regarding claim 20, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, ODA et al. discloses the diffraction grating structure is formed by bonding an optical film separately manufactured as a transmission type optical film that has the fine convex-concave structure to the outer surface of the color

separation filter. It has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179. As explained above, it would have been obvious to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Regarding claim 21, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, ODA et al. discloses the color separation filter is formed to have a single layer structure. It has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893). As explained above, it would have been obvious to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Regarding claim 22, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the color separation filter is formed to have a multi-layer structure (e.g., column 20, lines 1-20).

Regarding claim 23, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light emitted is substantially white light (e.g., column 23, lines 10-30; "... *various wavelengths exist as in white light*").

Response to Arguments

4. Applicant's arguments filed June 15, 2007 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "... *wherein a minimum light-emission value is equal to or less than 50% of a maximum light emission value when whit light is emitted from said light emitting portion*") are taught by the primary reference, Kobori (USPN 6,327,554). Although Kobori does not specify the specific light-emission value, general teachings of how changes in the thickness of films forming an organic EL device changes the spectra and luminance of light emitted out of the device. Kobori teachings simulation method and system for organic electroluminescent device, where the invention is concerned with an organic EL device that enable the light emitted therefrom to be effectively available with a reduced emission luminance variation (e.g., column 1, lines 1-15).

To further clarify, Kobori discloses in column 2, lines 10-60 that "... *the changes in the thickness of films forming an organic EL device give rise to changes in the spectra and luminance of light emitted out of the device. In order to use this device with a display device, it is desired that characteristic variation ascribable to them to be reduced as much as possible. Never until now, however, is any argument adduced about to what degree the optical thickness is controlled ... which enables light to be effectively taken out of even a structure comprising many reflective surface*"). In other words, various thicknesses of films forming an organic EL device was tested and results of its spectra and luminance of light emitted out of the device is taught by Kobori. Also, Figures 12-21 is evidence showing the effectiveness of spectral luminance based on the wavelengths and the thickness. The following teachings provide guidance as to

reconstruct/modify the thickness of films to form a highly effective organic EL device (e.g., column 22, lines 30-45; "... *comprising the above basic arrangement with changes in the thickness d3 of the ITO electrode were prepared by vapor deposition. Using a spectral luminance meter, the emission spectra were measured of each organic EL device. The obtained results are plotted in FIGS. 12 to 18 ... in principle, the changes in emission spectra manifest itself as an effect of optical modulation*").

Figures 12-21 may be partial representations of the overall emissions, the overall effective (e.g., "... *a minimum light-emission value is equal to or less than 50% of a maximum light emission value*") light emissions is desirable addressing the concern that Kobori had with an organic EL device (e.g., column 1, lines 5-15; "... *this invention is concerned with a simulation method and system for providing an organic EL device that enable the light emitted therefrom to be effectively available with a reduced emission luminance variation*").

Also, It would have been obvious to one having ordinary skill in the art at the time the invention was made to specify possible optimum value of the device, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Therefore, Kobori clearly suggest the applicant's claimed invention and claims 1-8 and 10-23 are properly rejected under 35 USC § 103. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it

takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Y. Choi whose telephone number is (571) 272-2367. The examiner can normally be reached on Monday-Friday (10:00-7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong-Suk (James) Lee can be reached on (571) 272-7044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jacob Y Choi
Examiner
Art Unit 2885

JC